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ABSTRACT

Academic libraries must reevaluate their instructional technology services in order to fulfill their mission of supporting the teaching activities of their parent institution in the current state of technological development. Applying modern approaches to further traditional library goals and making use of the expertise librarians gain while building and supporting electronic libraries can position the library at the center of an active instructional technology program that benefits the whole campus community. Librarians possess many skills--expertise with organizing information; teaching information literacy; creating and maintaining electronic libraries; concern for effective, easy, and equitable access; knowledge of user behavior; and relationship with faculty--that argue for their involvement with instructional technology support. Students benefit from richness added to the learning experience, and gain information skills that will help them both during and after their university careers. Instructors benefit because instructional technology can make their teaching more effective and more efficient. Librarians gain updated services, more visibility, a close working relationship with faculty, and an expanded electronic library that includes course materials in support of the university's instructional activities. (Author/SWC)

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Supporting Digital Instructional Technology:

The Role of the Academic Library

by

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Abstract

Academic libraries must reevaluate their instructional technology services in order to fulfill their mission of supporting the teaching activities of their parent institution in the current state of technological development. Applying modern approaches to further traditional library goals and making use of the expertise librarians gained while building and supporting electronic libraries can position the library at the center of an active instructional technology program that benefits the whole campus community.

Introduction

Modern information technology, the powerful alliance of desktop computing power and global telecommunication capabilities, holds great promise for furthering the teaching mission of universities. Finding the resources within the digital revolution that offer the best applications for education, exploiting them, and integrating them with the best aspects of traditional teaching significantly improve pedagogical efficiency and effectiveness. However, using these resources to further teaching requires expertise. Even though most colleges and universities provide support services to help faculty translate their educational goals into digital teaching modules and documents, the successful integration of these goals into courses requires competencies and services that have traditionally belonged to the realm of the academic library.

Rethinking and updating those skills and services -- developing information literacy skills, organizing knowledge to help create instructional modules, delivering information in an easily accessible, equitable and reliable way -- allow libraries to play a central role in instructional technology support, fulfilling the promise of their traditional mission of supporting instruction in a new era of technological development.

Teaching: new possibilities, classic models

Information technology milestones of the past, such as printing and affordable mass media, had major impacts on the way we teach and learn. However, no technological breakthrough managed to destroy the fundamental human bond of teacher and student or the centuries old classroom model that is based on that bond. This model is proving to be permanent because it satisfies one of the most important needs of the educational process: socialization. Distance education has become technologically possible but it is only reserved for special circumstances and it is not threatening to take over the mainstream of higher education.

Similarly, computer technology and worldwide telecommunication networks trigger another important shift in the instructional activities of institutions of higher education, but they have failed to usher in the all-encompassing revolution that many have predicted. They bring more convenient ways of

conducting business, and they represent exciting opportunities for broadening the learning experience and for providing involvement and interaction with instructors, experts and fellow students both on and off campus, but the new technology has not and will not change the traditional framework of college and university instruction. Today and even tomorrow the instructor will be responsible for guiding the learner, for leading the discovery process, and for charting out the course of the instruction.

There are an ample number of testimonials in the literature about the new dimensions that are now possible in teaching. Electronic textbooks and teaching modules can translate static pictures into dynamic images to provide better understanding and easier recall of information. Quizzes and testing utilities help the learner or the instructor evaluate the knowledge gained.[1] A more complex and meaningful performance assessment technique is to ask students to perform tasks that involve using the skills that the instructor wants to evaluate. New methods of doing this include computer simulations, progress reports, interviews, and final multimedia presentation of projects.[2] Hypertext and hypermedia provide a non-linear, self-paced presentation of text-based information and other illustrative material such as photographs, charts, movies and audio. Text and datafiles can be downloaded as assignments for further analysis and manipulation. E-mail and listservs can improve communication between instructor and students as

well as between students. Networked information resources such as numeric, spatial, bibliographic and full-text databases can be utilized for research projects. Guest lectures and cross-institutional joint student projects can be conducted via e-mail, file transfer and electronic video conferencing.[3] Interactivity and active approaches to teaching such as simulations and manipulating data, now easily achieved with the use of new technologies, have been shown to foster problem solving and critical thinking skills.[4]

It is easy to see how incorporating such elements into courses enrich the learning process. At the same time, it is also easy to see the increased pedagogical and technological demands that it puts on the instructors. How do they find out what is technologically possible? How do they match up educational goals with the technology that is best suited to achieve them? How do they go about creating these modules? How do they integrate them into the courses? How will the modules be delivered to the students? Instructors need a campus infrastructure to support them if they are to successfully realize the promises that new technology holds for their teaching.

Instructional technology: product vs. process

In 1969 the Presidential Commission on Instructional Technology undertook the groundbreaking task of defining and evaluating the potential of instructional technology. They produced a set of recommendations for

Congress and the President[5]. Their definition involves two distinct concepts. The first, more limited and traditional concept is instructional technology as a product. It includes media, both hardware and software, that are used to support teaching. World Wide Web pages that were developed to support a specific course and to achieve a certain educational goal would be considered instructional technology products.

The Presidential Commission also defined instructional technology as a process; "a systematic way of designing, carrying out, and evaluating the total process of learning and teaching in terms of specific objectives, based on research in human learning and communication, and employing a combination of human and nonhuman resources to bring about more effective instruction. ...Though only a limited number of institutions have attempted to design instruction using such a systematic, comprehensive approach, there is reason to believe that this approach holds the key to the contribution technology can make to the advancement of education."[6] This latter, forward-looking definition eventually evolved into the "systems approach" to instruction and instructional technology. According to this approach instructional technologists do more than dispense hardware and software. They are in a good position to help instructors with planning their courses, learning activities, discussions, testing and course evaluation.[7] The systems paradigm is still the dominant one in the field as evidenced by the 1994 definition of the field endorsed by the Association for Educational

Communications and Technology. It defines instructional technology as "the theory and practice of design, development, utilization, management, and evaluation of processes and resources for learning."[8] The five domains that are included in the definition reflect the different stages of the systems model.

Libraries that are reevaluating their roles in instructional technology support have to make sure that they take a broad view of the field and do not think about instructional technology as products only. It is best to consider all aspects in the context of the library's mission and the service and technical infrastructure that already exists on campus. Stressing collaboration with other departments and units on campus and having a clear and up-to-date sense of what the real mission of the library is will make the library well-positioned to find a niche and help improve the instructional activities of the institution.

The library's role

Academic libraries have been providing some instructional technology related services. These might be limited to maintaining a collection of media items to support courses, or they might include a complete media or instructional technology department under the library's auspices. Even if the library has not been involved with instructional technology at all, this is a good time to

rethink what role they might want to play in the future. Here are a few reasons why.

It is becoming more and more impossible to teach, learn and work effectively without an ever-increasing arsenal of technological and information literacy. The range of skills and affinity that students and instructors possess in this area varies greatly. Academic librarians are experts at assessing and raising the level of information literacy of their constituents. It is essential to regularly survey the skills and competencies that are needed for research, education, and work, both during and after the university years. This will provide us with goals for our information literacy training of both students and faculty. Improving information skills lays the groundwork for further activities.

One further activity is to help faculty improve their pedagogical effectiveness by incorporating modern instructional technologies. The first step of this process is raising the awareness of the faculty about what is possible with the aid of new technology and why they should attempt to incorporate these elements into their courses. This awareness raising often needs to be followed up with consultations in pedagogy and instructional development. Only experts with special training in college level teaching should be involved with such consultation activities since they essentially involve formulating

teaching goals, translating them into instructional technology terms, and planning out evaluation processes. The effects of the planned course materials and teaching modules on different aspects of the learning cycle also have to be considered. Such consulting services are clearly outside the training and domain of librarians, but there is no reason why the library could not employ a specialist specifically trained in the relevant educational fields, if the campus lacks one. However, if such consulting services already exist on campus it is wisest to collaborate with staff in these offices instead of trying to duplicate or compete with them.

The next step of the development process is the actual creation and delivery of the teaching module itself. This is where the expertise of librarians can be invaluable in a number of different ways. Librarians have much experience with the organization of material based on a knowledge of user behavior. This experience can be utilized for the design of instructional technology products. Librarians also have years of experience creating and delivering electronic library systems and related electronic services. They understand production issues, are skilled at collaborating with diverse groups and have a reliable information and telecommunications infrastructure for the dependable and equitable delivery of the end products. Delivering course-related electronic materials can also be considered a logical extension of the traditional library reserve function since it provides increased access to course

support materials that used to be distributed in print or other traditional media such as slides.

Libraries are obviously well-positioned to provide support services that focus on instructional technology as a product. Clear parameters have to be established by defining what media, what hardware, and what software to support. Libraries also have to think through how much and exactly what aspects of the instructional technology process they are qualified to address. Service limitations and who to contact for what services need to be very clearly articulated and communicated to faculty to avoid both confusion and the impression of duplicated services. When the library cannot provide all instructional technology services without relying on other campus entities for some aspects, the process an instructor goes through from the inception of the idea to the finished product has to be carefully analyzed. This way the library can plan out the logistics of cooperation and referrals in a way that the process seems virtually seamless for the faculty member.

The Mann Library model

Cornell University's Mann Library developed a systematic approach and a suite of seamlessly combined services to support instructional technology activities in the colleges it serves (College of Agriculture and Life Sciences, College of Human Ecology, Division of Biological Sciences, Division of

Nutritional Sciences.) We refer to our approach as "soup to dessert" meaning that we handle projects from conception through delivery. The only service that Mann does not provide is pre-conception counseling: pedagogical and instructional development consultations. These are handled through Cornell's university-wide Office of Instructional Support.

Our active instructional program concentrates on improving information literacy in both faculty and students. For faculty and their TAs we offer classes that make them aware of the instructional possibilities of new technologies and acquaint them with our instructional support services. We also teach them how to design course materials for the World Wide Web and how to incorporate forms into their Web pages. Our student classes cover a wide variety of information retrieval and management tools. Mann Library is in the process of updating an information literacy needs assessment survey that focuses on information skills that Cornell graduates and their employers rate as most essential for the modern workplace.[9] Results of this survey will no doubt fine-tune our current class offerings to better meet the present and future needs of the student population.

Last year the Technologies for Learning Center (TLC) was established within the library to provide specialized hardware, software, and consulting assistance to faculty for the creation of digital teaching modules. The TLC

manager is also charged with watching the technological horizon and evaluating emerging technologies for their potentials for teaching. Specialized peripherals for scanning different media and for digitizing and manipulating sound and video are used with multimedia authoring and presentation programs to create complete multimedia packages. The TLC also has CD-ROM mastering capabilities for the delivery of massive amounts of data. Because of the leading edge and highly technical nature of what the TLC does, it is managed out of the Information Technology Section (i.e. systems department) of Mann Library.

What makes our approach especially well-rounded is the addition of a third component to our services. This area, the one that the author is responsible for, is actually the hardest one to name or label. It involves the creation of a hospitable environment and infrastructure that make it possible to integrate instructional technology into the teaching mainstream. Our desire to raise the faculty's awareness of what they could easily accomplish with instructional technology and to support faculty in starting these activities stems from the realization that even the most basic networked utilities have been underutilized by the faculty for course-related purposes. If the TLC is concerned with the more forward-looking, leading edge or complex projects, this third component of our services focuses mostly on the technologies that any instructor can easily incorporate into their teaching repertoire without a

big investment of time, effort, or funding. At this point these widely promoted features include using the World Wide Web to disseminate course related information such as syllabi, reading lists, lecture notes, tests, text and datafiles, scanned slides, assignments, and links to other Web sites that are relevant to the course. This new approach to delivering course material is more convenient for the students as well as the instructors. It eliminates a lot of photocopying and makes updating documents easy and immediate. It also adds new dimensions to the learning process by providing capabilities that were not available before. And as an added bonus, it decreases the demand on traditional reserve services and improves access to materials for the students.

Spreading the use of the Web for courses involves four main activities: making instructors aware of its capabilities and advantages, offering consultations to interested faculty on any aspect of the project, arranging for delivery by maintaining and offering server space to interested faculty, and finally, creating and maintaining a single point of entry to instructional pages. Raising awareness is accomplished through publicity efforts such as newsletter articles and direct mailings on the one hand, and through participating in special faculty classes on the other. Word of mouth advertising and personal contacts also work very well for spreading the word. One-on-one consultations are essential for success. For some instructors

consultations serve as a follow-up to instructional sessions that they attend. For others, it is a substitute since sometimes they cannot fit the classes into their busy schedules. Consultations accommodate different learning styles as well. Many people we work with prefer to learn on their own by following a tutorial or a manual, and then they come to us with advanced questions that are very specific to their projects. Consultations sometimes take place at the instructor's office. Learning on their own computer maximizes their efficiency and comfort level. Once the instructors prepare their HTML files, the library assigns them a password-protected directory on a server. We teach the faculty member how to upload his or her files to the server using File Transfer Protocol, and except for updates, that is the end of the project as far as their involvement is concerned. The library, however, has one more step to complete. We established a single point of entry for all pages that were created for the courses that our colleges offer. This feature is analogous to the centralized course reserve catalogs that libraries have maintained for decades. Students, instead of having to remember unwieldy URLs for several courses, are able to follow a link to the instructional environment right from our library's homepage. Course numbers are listed and grouped by both college and professor. This way the students are always only a few mouse clicks away from their course pages.

Conclusion

Academic libraries have always had a lot to offer when it comes to supporting the instructional activities of their institutions. This is especially true in the current phase of technological development. Many things argue for our involvement with instructional technology support: our expertise with organizing information, with teaching information literacy, with creating and maintaining electronic libraries; our concern for effective, easy, and equitable access; our knowledge of user behavior; and our relationship with faculty. Helping faculty to exploit the many possibilities that modern computing and telecommunication offer to instruction is a win-win situation. Students benefit from the richness that is added to the learning experience. They also gain information skills that will help them with their learning and research both during and after their university careers. Instructors benefit because instructional technology can make their teaching more effective and more efficient. And what do librarians gain? Updated services, more visibility, a close working relationship with the faculty, and an expanded electronic library that now includes course materials in support of the university's instructional activities.

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